

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Service Rules for Advanced Wireless)	WT Docket No. 12-70
Services in the 2000-2020 MHz and)	
2180-2200 MHz Bands)	
)	
Fixed and Mobile Services in the Mobile)	ET Docket No. 10-142
Satellite Service Bands at 1525-1559 MHz)	
and 1626.5-1660.5 MHz, 1610-1626.5 MHz)	
and 2483.5-2500 MHz, and 2000-2020 MHz)	
and 2180-2200 MHz)	
)	
Service Rules for Advanced Wireless)	WT Docket No. 04-356
Services in the 1915-1920 MHz,)	
1995-2000 MHz, 2020-2025 MHz, and)	
2175-2180 MHz Bands)	

REPLY COMMENTS OF GLOBALSTAR, INC.

Globalstar, Inc. (“Globalstar”) hereby replies to comments filed in response to the Federal Communications Commission’s (“FCC’s” or “Commission’s”) Notice of Proposed Rulemaking and Notice of Inquiry in the above-captioned proceeding.¹ The Commission’s proposal for an “AWS-4” band and new rules for terrestrial use of mobile satellite service (“MSS”) spectrum at 2 GHz has received widespread support from commenters, who recognize that greater terrestrial flexibility in the MSS bands will yield substantial public interest benefits by making 40 megahertz of additional spectrum available for mobile broadband use. Bolstered by this support, the Commission should expeditiously adopt new, clearly-defined rules for MSS-terrestrial operations in the 2 GHz band, and immediately thereafter initiate a proceeding to provide similar relief in the Big LEO band.

¹ *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, et al.*, WT Docket Nos. 12-70 & 04-356 & ET Docket No. 10-142, Notice of Proposed Rulemaking and Notice of Inquiry, FCC 12-32 (rel. Mar. 21, 2012) (“2 GHz NPRM”).

While a number of commenters request significant changes to the Commission’s AWS-4 proposal, the Commission should adhere to the basic licensing and regulatory framework described in the *2 GHz NPRM*. The record confirms the Commission’s tentative conclusion that AWS-4 terrestrial authority should not and cannot be assigned to any entity other than the 2 GHz MSS licensee, and the Commission should avoid additional conditions and restrictions that would stifle wireless broadband investment in the 2 GHz band. Finally, Iridium’s arguments against similar relief in the Big LEO band are once again without merit. Accordingly, the Commission should act promptly in the instant proceeding and in the Big LEO band to realize the full public interest benefits of MSS spectrum.

I. As Proposed in the 2 GHz NPRM, the FCC Should Modify DISH’s MSS License to Incorporate AWS-4 Authority

A. Spectrum sharing between separately licensed and controlled MSS and terrestrial operators is not technically feasible

Numerous parties agree with the Commission’s tentative finding in the *2 GHz NPRM* that spectrum sharing by separately licensed and controlled MSS and terrestrial operators is not technically feasible, and that AWS-4 terrestrial rights should therefore be granted to DISH rather than to other parties at auction.² In contrast, MetroPCS suggests that spectrum sharing between

² DISH Network Corp. Comments at 9-15 (“[T]he Commission’s proposal is the only workable means by which a robust terrestrial mobile broadband provider can share the 2 GHz Band with an MSS/ATC service”) (“DISH Comments”); Alcatel-Lucent Comments at 6-7 (“Cochannel sharing between MSS and terrestrial operations presents technical challenges, even for a single entity. Without coordination . . . there will be uncontrolled interference between terrestrial base stations and a co-channel satellite.”) (“Alcatel-Lucent”); Nat’l Rural Telecomms. Coop. Comments at 4 (“While considerable technological advances have been made over the last decade, these particular advances do not suggest that same-band, separate-operator sharing of the 2 GHz band is any more technologically or economically feasible than it was in 2003 when the Commission last analyzed this scenario.”); Satellite Indus. Ass’n Comments at 3 (“The only effective way to prevent harmful interference under these circumstances is to ensure that 2 GHz MSS operators have control over AWS operations in the band, as the NPRM proposes.”); U.S. GPS Indus. Council Comments at 3 (“Where space-based and terrestrial systems share the same spectrum, careful coordination is required in order to avoid harmful interference between and among facilities operating in the two

unaffiliated MSS and terrestrial networks may now be feasible due to changing technology.³ Citing the development of advance coding and interference cancellation and mitigation techniques, MetroPCS asks the Commission to “reexamine the extent to which sharing by terrestrial and satellite services in the same area is possible.”⁴

The Commission should affirm its tentative conclusion on this important issue. In its comments, DISH provides the Commission with a thorough engineering analysis that once again demonstrates the infeasibility of spectrum sharing between separately licensed and controlled MSS and terrestrial operators.⁵ Based on quantitative analysis, the DISH Technical Statement concludes that “[s]eparate, unaffiliated operators are unlikely to succeed in organizing and managing the highly complex coordination process required between both satellite and terrestrial systems at the same time, in the same band, and in the same region.”⁶ According to DISH, separately controlled co-frequency operations would pose a significant threat of harmful interference to MSS satellite and handset reception, as well as to AWS-4 base station and handset reception.⁷ The only way to avoid such harmful interference, the DISH Technical Statement demonstrates, is for co-frequency MSS and terrestrial systems to be controlled by the same operator. Common control would enable real-

services.”). *See also* Sprint Nextel Corp. Comments at 6 (assignment of AWS-4 authority to the incumbent MSS licensee “should reduce the technical complications related to both potential inter- and intraband interference issues, and result in a more expeditious AWS-4 licensing process”). (Except where otherwise noted, comments cited herein were filed in WT Docket No. 12-70 on May 17, 2012.)

³ MetroPCS Communications, Inc. Comments at 19-21 (“MetroPCS Comments”).

⁴ *Id.* at 20.

⁵ *See* DISH Comments at Exhibit 1, Engineering Analysis of Dr. Richard Barnett, Telecom Strategies, Inc., and Dr. Michael Dellomo, Radyn, Inc. (“DISH Technical Statement”).

⁶ DISH Technical Statement at 1; *see also id.* at 8-14 (“Section 4 – Interference Computations Confirm Harmful Interference Between Separate MSS/ATC and AWS-4 Operations”).

⁷ DISH Technical Statement at 2-5 (“Section 1.3 – Interference Between Separate MSS and AWS-4 Operations”).

time management of the communications links operating in both the satellite and terrestrial systems,⁸ which is essential to successful spectrum sharing.⁹

Significantly, if the Commission were to assign AWS-4 authorizations through competitive bidding, AWS-4 licensees would have to share their 2 GHz spectrum not only with an MSS network, but also with any ancillary terrestrial component (“ATC”) systems operated by the MSS licensee.¹⁰ No party claims that spectrum sharing between two separately controlled, competing terrestrial wireless systems would be technically feasible. The DISH Technical Statement confirms that such sharing is not feasible, as these co-frequency operations would raise intractable operational and interference issues that could not be practically mitigated.¹¹

B. Modification of DISH’s license to include AWS-4 authority is consistent with the Communications Act

Only one commenter, NTCH, Inc. (“NTCH”), claims that the Communications Act of 1934, as amended (the “Act”), prohibits the proposed modification of DISH’s MSS license and instead requires the assignment of AWS-4 terrestrial licenses through competitive bidding.¹² The

⁸ DISH Comments at 11-12. Dynamic frequency coordination between non-geostationary (“NGSO”) MSS constellations (like Globalstar’s) and terrestrial wireless networks is particularly challenging. Since NGSO satellites are constantly in motion, tracking the satellite beam patterns and dynamically allocating channels between the NGSO and terrestrial systems over time is extremely complex. An MSS licensee is the only entity with the requisite system software and expertise to manage this channel assignment process. Thus, to mitigate any interference in this scenario, terrestrial operations must be controlled by the MSS licensee or its affiliates.

⁹ The DISH Technical Statement demonstrates that LTE implementation does not resolve the interference issues that would result from separately controlled MSS and terrestrial operations. While LTE enables operators to dynamically reassign spectrum among various nodes and users, such dynamic control cannot be achieved without sufficient integration of the terrestrial and satellite service providers. DISH Comments at 13; DISH Technical Statement at 6-8 (Sections 1.5 – 3.2).

¹⁰ 2 GHz NPRM ¶ 70.

¹¹ DISH Comments at 13-14 (“no two competing operators are likely to succeed in organizing and managing the highly complex coordination process required between both the ATC and terrestrial services at the same time, in the same band, and in the same region”); DISH Technical Statement at 6 (Section 2).

¹² NTCH, Inc. Comments at 3-7.

Commission should reject this flawed argument. As the *2 GHz NPRM* points out, Section 316 of the Communications Act provides that the Commission has authority to modify a station license if “in the judgment of the Commission such action will promote the public interest, convenience, and necessity.”¹³ The courts have confirmed the broad nature of this authority, finding the Commission can modify a radio license as long the agency has concluded that the proposed modification will meet this Section 316 public interest standard.¹⁴

In the instant case, the Commission’s proposed modification of DISH’s 2 GHz MSS license easily satisfies the statutory criteria. By making 40 megahertz of additional spectrum available for mobile broadband use, this modification will help alleviate the impending broadband spectrum crunch. In addition, incorporating the AWS-4 terrestrial authority into DISH’s existing MSS license will avoid the harmful interference that would result from separately controlled MSS and terrestrial operations in the band. This outcome clearly furthers the public interest.

The Commission should reject NTCH’s unfounded claim that the proposed AWS-4 authority constitutes an initial license that must be auctioned under Section 309(j) of the Communications Act. It is well established that the Commission can adopt licensing mechanisms through its rulemaking processes that prevent the filing of competing applications.¹⁵ With its

¹³ *2 GHz NPRM* ¶ 75, quoting 47 U.S.C. § 316(a)(1).

¹⁴ *Cal. Metro Mobile Commc’ns v. FCC*, 365 F.3d 38, 44-45 (D.C. Cir. 2004).

¹⁵ See *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, 19 FCC Rcd 14969, ¶ 69 (2004) (“*800 MHz Order*”) (stating that “[n]othing in Section 309(j) requires the Commission to accept mutually exclusive applications in the first place” and pointing out that “the Commission is not required to open all frequencies for competing applications, as long as it provides a reasoned explanation of its decision not to do so” (citing *Rainbow Broadcasting v. FCC*, 949 F.2d 405, 409-410 (D.C. Cir. 1991))). As the Commission also indicated in the *800 MHz Order*, Section 309(j)(6)(E) states that “[nothing in this subsection shall] be construed to relieve the Commission of the obligation in the public interest to continue to use engineering solutions, negotiation, threshold qualifications, service regulations, and other means in order to avoid mutual exclusivity in application and licensing proceedings.” 47 U.S.C. § 309(j)(6)(E); *800 MHz R&O* ¶ 73.

proposed licensing approach in the 2 GHz NPRM, the Commission has foreclosed competing applications and avoided the mutual exclusivity that can trigger the Act's auction requirements.

II. The Commission Should Not Impose Conditions and Restrictions That Would Discourage Wireless Broadband Investment and Development

In their comments, T-Mobile USA, Inc. ("T-Mobile"), RCA – The Competitive Carriers Association ("RCA"), and New America Foundation, Public Knowledge, and Consumers Union ("New America *et al.*") request that the Commission adopt various conditions and restrictions on AWS-4 authority that were not proposed in the 2 GHz NPRM.¹⁶ Among other things, these parties propose more rigid build-out requirements,¹⁷ harsher penalties for non-compliance with those build-out obligations,¹⁸ requirements for the AWS-4 licensee to make a minimum percentage of its capacity available to other carriers,¹⁹ prior approval procedures for certain wholesale arrangements,²⁰ and limits or prohibitions on certain spectrum arrangements with AT&T and Verizon.²¹

¹⁶ T-Mobile USA, Inc. Comments at 8-17 ("T-Mobile"); New America Foundation, Public Knowledge, and Consumers Union Comments at 7-19 ("New America *et al.*"); RCA – The Competitive Carriers Ass'n Comments at 6-8, 11 ("RCA").

¹⁷ T-Mobile at 9-11 (proposal for build-out requirements that mirror those imposed on LightSquared in 2010).

¹⁸ T-Mobile at 12 (proposal for Commission revocation of all AWS-4 authority from DISH if it fails to meet the final build-out deadline in *any* EA license area).

¹⁹ RCA at 7 (proposal to require AWS-4 licensees to make available a minimum percentage of their spectrum capacity to competitive carriers at wholesale rates); New America *et al.* at 9 (proposal to require the AWS-4 licensee to make up to 50 percent of its capacity available in each EA for open wholesale leasing by any qualified entity, or for roaming by other carriers, on a non-discriminatory basis).

²⁰ New America *et al.* at 11-12 (proposal to require the AWS-4 licensee to seek Commission approval before making more than 25 percent of the licensee's data traffic capacity within any EA available to any other entity).

²¹ RCA at 7 (proposal to require AWS-4 licensees to receive Commission approval before entering into any direct or indirect wholesale agreement with the "largest or second largest wireless provider" and requiring Commission approval for those providers' combined use of over 25 percent of the terrestrial capacity of AWS-4 spectrum); New America *et al.* at 18-19 (proposal for unjust

The FCC should not adopt any conditions or restrictions that would discourage rather than stimulate investment in wireless broadband facilities in MSS spectrum. For instance, overly stringent build-out requirements and related penalties would have a substantial deterrent effect on broadband development in the 2 GHz band. In opposing such provisions, Globalstar is consistent with the numerous commenters who urge the Commission to adopt *less* formidable build-out requirements and *less* severe penalties than proposed in the *2 GHz NPRM*.²² With respect to the leasing and wholesaling issues, the Commission's regulatory approach in the 2 GHz band should be guided by its existing secondary market leasing policies, procedures, and rules, including its prior decision to extend the spectrum manager leasing framework to MSS ATC spectrum.²³

In proposing additional conditions and restrictions, commenters state that such provisions are necessary to prevent DISH from gaining an unfair "windfall" from its AWS-4 terrestrial rights.²⁴ Key factors weigh against finding such a "windfall" in the MSS-terrestrial context, however. First, the Commission has repeatedly increased licensee flexibility in different spectrum bands without

enrichment penalties to be triggered if AWS-4 licensed is sold, transferred, or substantially leased to one of the two largest CMRS and mobile broadband carriers).

²² See, e.g., AT&T Comments at 11-14 ("The Commission's proposed performance requirements for AWS-4 licensees are too stringent and do not strike the appropriate balance between incentivizing deployment and affording licensees the flexibility necessary to put spectrum to its highest and best use. . . . [T]he Commission's proposed penalty for failure to meet a construction requirement is too draconian and inconsistent with the requirements applicable to other comparable services."); CTIA Comments at 16-17 ("CTIA is strongly opposed to these [proposed penalties] as contrary to the public interest and unduly burdensome and potentially harmful not only to licensees but also to potential consumers of the new service."); Alcatel-Lucent at 16 ("[T]he Commission's proposed milestones, which include automatic termination without Commission action, are draconian and could strand 2 GHz satellite and AWS-4 terrestrial customers without service"); Computer and Commc'ns Indus. Ass'n Comments at 6 ("[T]he Commission's proposed build-out requirements are overly aggressive and will undermine the Commission's goals of utilizing additional spectrum for mobile broadband use and spurring investment and competition in the mobile broadband market.").

²³ *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, Report and Order, 26 FCC Rcd 5710, ¶¶ 14-19 (2011).

²⁴ See *New America et al.* at 3; *RCA* at 4.

finding that it had conferred a windfall.²⁵ Just as in these other proceedings, adopting a more flexible regulatory framework for terrestrial use of MSS frequencies will simply maximize the public interest benefits of licensees' MSS spectrum.²⁶ Second, the design, construction, launch, and operation of an MSS system requires a substantial investment. Globalstar, for instance, has invested more than \$5 billion into the deployment of its Big LEO MSS network. Notwithstanding the FCC's future treatment of terrestrial operations in Big LEO spectrum, Globalstar could not be characterized as enjoying a windfall in this band.²⁷

III. Iridium's Tired Claims Regarding the Big LEO Band are Baseless

As it has done numerous times before, Iridium argues in its comments that the Commission should "ensure that the Big LEO band is preserved for satellite use and reject any suggestions that

²⁵ See, e.g., *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, ¶¶ 5, 12, 150, 157 (2004) (fundamentally restructuring the 2.5 GHz band and granting greater flexibility to EBS licensees, among other operators, including allowing them to lease up to 95 percent of their spectrum capacity to commercial operators for non-educational uses in order to promote the "economic viability" of EBS operations); *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, Report and Order and Second Report and Order, 25 FCC Rcd 11710, ¶ 24 (2010) (amending technical rules to permit WCS licensee to deploy mobile broadband services, thus "increas[ing] the supply of flexible use spectrum that can be used to address the explosive nationwide growth in consumer demand for mobile broadband services"); *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees*, Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 26 FCC Rcd 11614, ¶¶ 2-3 (2011) (increasing flexibility in the use of microwave spectrum licensed under Part 101 of the Commission's rules, in order to "remove regulatory barriers that today limit the use of spectrum for wireless backhaul and other point-to-point and point-to-multipoint communications").

²⁶ By providing MSS licensees with greater terrestrial flexibility, the Commission will help alleviate the impending spectrum deficit, avoid the interference that would result from spectrum sharing between separately controlled MSS and terrestrial systems, and help reinvigorate the development of satellite services in the United States and around the world.

²⁷ The Commission should also bear in mind that the original cellular licensees at 850 MHz obtained those licenses without charge, and no one has claimed that those parties enjoyed an illegitimate windfall.

terrestrial operations should be expanded in the band.”²⁸ Just as in its previous filings, however, Iridium makes no effort to explain how or why terrestrial use of Globalstar’s Big LEO spectrum would cause it harm or prevent the use of its own frequencies for MSS. In particular, Iridium provides no technical evidence that such terrestrial operations would cause harmful interference – or any other harm – to its current or future services above 1618.725 MHz.²⁹ Instead, Iridium simply offers a high-level review of its MSS offerings and its recent financial results.³⁰

Iridium’s unsupported arguments regarding terrestrial use of Big LEO spectrum are clearly without merit. Globalstar recognizes, however, that the instant 2 GHz rulemaking is not the right proceeding for considering these Big LEO issues. Rather, the Commission should address these issues in a new rulemaking on increased terrestrial flexibility in the Big LEO band, a proceeding that should be initiated immediately after the Commission issues its order in the 2 GHz docket.

²⁸ Iridium Comments at 6. *See also* Comments of Iridium Satellite LLC, ET Docket No. 10-142, at 9 (Sep. 15, 2010); Comments of Iridium Satellite LLC, IBFS File No. SAT-MOD-20101118-00239, at 4 (Dec. 2, 2010); Response of Iridium Satellite LLC, IB Docket No. 11-149 & ET Docket No. 10-142, at 2-3 (Oct. 27, 2011).

²⁹ In the 2008 order expanding Globalstar’s ATC authority to the edge of its unshared spectrum at 1617.775 MHz, the Commission found no threat of interference to Iridium’s MSS operations. *Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands; Globalstar Licensee LLC, Authority to Implement an Ancillary Terrestrial Component*, Report and Order and Order Proposing Modification, 23 FCC Rcd 7210, ¶¶ 19-20 (2008).

³⁰ If Iridium’s concern is that terrestrial use of Globalstar’s Big LEO L-band spectrum will prevent Iridium from gaining access to that spectrum, Iridium’s ambitions should be summarily rejected by the Commission. Once complete and operational, Globalstar’s second-generation MSS system will make intensive use of every available megahertz of L- and S-band spectrum in order to provide an array of services to customers around the world. Globalstar will have no excess L-band frequencies. Moreover, the Commission revised the Big LEO band plan less than five years ago, taking 2.6 MHz of L-band spectrum from Globalstar and adding it to Iridium’s licensed TDMA spectrum allotment. Iridium has provided no reason to revisit that decision. *See Spectrum and Service Rules for Ancillary Terrestrial Components in the 1.6/2.4 GHz Big LEO Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Second Order on Reconsideration, Second Report and Order, and Notice of Proposed Rulemaking, 22 FCC Rcd 19733 (2007).

Globalstar looks forward to responding to Iridium's claims more fully in that future Big LEO rulemaking proceeding.

IV. Conclusion

For the aforementioned reasons, the Commission should move expeditiously to adopt new, clearly-defined rules for terrestrial operations in MSS frequencies in the 2 GHz band and immediately thereafter in the Big LEO band. In doing so, the Commission should adhere to the basic licensing and regulatory framework that was described in the *2 GHz NPRM*.

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